PORT AUTHORITY STANDARDS EXCEEDING CODE

QUALITY ASSURANCE

PORT AUTHORITY STANDARDS EXCEEDING CODE

The following PA Standards are additional to the Code requirements and are included in the Tenant Construction Review Manual (TCRM), except item 7, which will be incorporated in the next revision of the Manual . All other PA requirements listed in the TCRM are for compatibility, specific Facility requirements, or Code clarifications:

1. ***Interior Plastic Signs:***
   - In the absence of clear provisions in the Codes, this standard sets criteria for plastic signs to reduce fire and smoke hazards. This standard was introduced after a study and report by a consultant. Memorandum, E. Fasullo to P. Blanco, et al., dated 5/17/94. (TCRM, Attachment A1)

2. ***Flammability of Drapery, Upholstery and Furniture:***
   - Flammability of Drapery and Curtain Materials in unsprinklered areas. (TCRM, Attachment A2)

   - Flammability of Upholstery Material and Plastic Furniture in unsprinklered areas. (TCRM, Attachment A3)

   - Flammability of Plastic Laminate and Wood Veneer Furniture in unsprinklered areas. (TCRM, Attachment A4)

   These standards are intended to control fire and smoke hazards in unsprinklered areas. Building Codes have no provisions for draperies and furnishings.

3. ***Seismic Design – New York City Building Code:***
   - To ensure that potential overhead hazards will not fall on building occupants, seismic design requirements have been added for overhead signs, suspended ceilings, elevator and counter weight guardrails and supports, gas and high hazard piping, HVAC ducts and other piping. . Also, horizontal force factor(Cp) has been increased for sprinkler piping. Memorandum, O. Suros to E. Fasullo, dated 8/8/95. (TCRM, Attachment S3)

4. ***Use of PVC :***
   - Wiring and Conduits: This standard has been amended, as per Memorandum, F. Lombardi to K. Antion, dated 8/20/97, to permit PVC insulated wire and cable in buildings (TCRM, page 9-3, Section 9.IV.A.8).

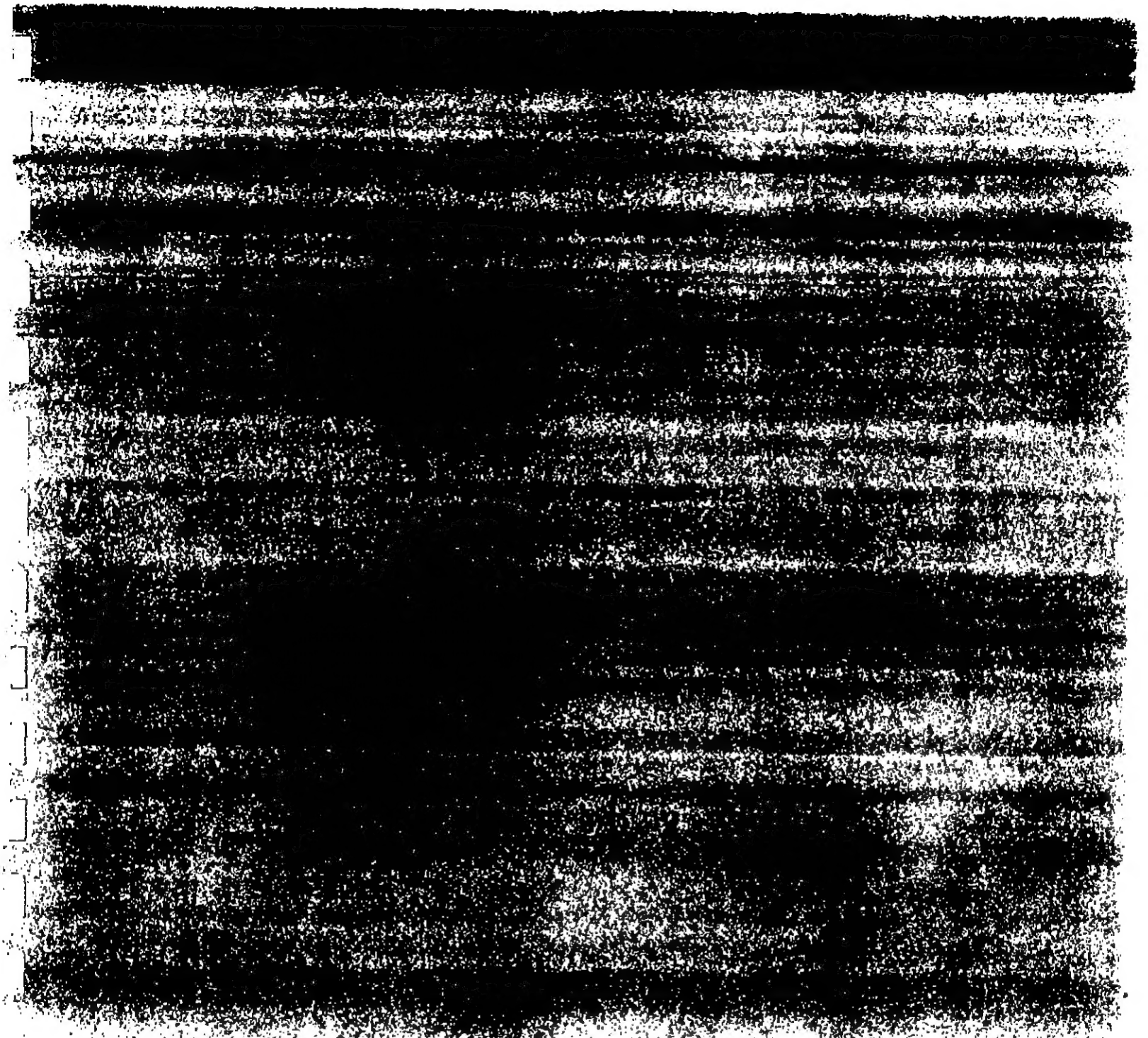
- Prohibition of PVC for mechanical and plumbing piping within buildings (TCRM, pages 9-3, 10-5 & 11-2, Sections 10.IV.D.1 & 11.IV.A.1).

These requirements are intended to avoid toxic gases from burning PVC.

5. ***PABT Smoke Purge:***
   - This special smoke purge requirement is intended to keep the public spaces smoke-free in the event of smoke condition within tenant spaces with open store fronts at the PA Bus Terminal. (TCRM, Attachment M1, page M1-3, paragraph G)

6. ***Escalator Safety Policy:***
   - The policy was introduced to prevent the sudden collapse of escalator treads. Memorandum, F. Lombardi to L. Borrone, et al., dated 10/1/96. (TCRM, page 10-5, Section 10.IV.D.2)

7. ***Marking of Transparent Glass Doors and Sidelights:***
   - In the absence of marking requirements in the New Jersey Uniform Construction Code, a policy for marking, similar to the NYC Board of Standards and Appeals Rules, was introduced for all PA facilities. Memorandum F. Lombardi to L. Borrone, et al, dated 5/24/99.



THE PORT AUTHORITY OF NY & NJ
QUALITY ASSURANCE DIV.
ENGINEERING DEPT.

JUN 15 1994

RECEIVED

NOTED:
REFERRED TO:

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY

M E M O R A N D U M

TO: P. Blanco, R. Kelly, L. Liburdi, C. Maikish, D. Plavin
FROM: Eugene J. Fasullo
DATE: May 17, 1994
SUBJECT: P.A. STANDARD FOR INTERIOR PLASTIC SIGNS

REFERENCE: Memo, E. Fasullo to Plavin, Kelly, Maikish, Liburdi, Blanco, dated 12/9/93

COPY TO: R. Cupelli, R. Davidson, W. Goldstein, E. Lipson, F. Lombardi, E. Ramabhushanam, File

Attached is a copy of our new "Standard for Interior Plastic Signs". This will now apply to plastic signs within all Port Authority Facilities. It will be distributed to tenants together with our "Tenant Review Manual" and to appropriate Engineering and Line Department staff for our own projects.

Eugene J. Fasullo, P.E.
Director of Engineering &
Chief Engineer

Attachment

CONCURRED:
William H. Goldstein
Deputy Executive Director/
Capital Programs

COPY TO	
ER	✓
LL	
PC	✓
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SB	✓
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ATTACHMENT A1

STANDARD FOR INTERIOR PLASTIC SIGNS

1.0 General: The provisions of this specification shall govern the design and use of interior plastic signs and panels in both New York & New Jersey.

2.0 Definitions, symbols and notations: The following definitions, symbols and notations shall apply to the provisions of this standard (units in parenthesis are for the variable described):

A_s (ft^2) =	Allowable sign facing area
L (ft) =	The length along the ceiling of a ceiling sign
P_w (ft) =	Minimum distance between an egress path and a sign. Distance can be passage width or height
t (inches) =	Thickness of sign facing material(s)
V_c (ft^3) =	Volume of space or room in which the sign is located

Ceiling sign: A ceiling mounted sign with its top located within one foot of the ceiling and its bottom located five feet or higher above the floor.

Interior plastic sign: A sign, located within a structure, which has a facing which is constructed of plastic.

Multiple-faced sign: A sign with more than one exposed face.

Sign: Any fabricated sign or display structure, including its structure, consisting of any letter, figure, character, mark, point, plane, marquee sign, design, poster, pictorial, picture, stroke, stripe, line, trademark, reading matter or illuminating device, which is constructed, attached, erected, fastened or manufactured in any manner whatsoever so that the same shall be used for the attraction of the public to any place, subject, person, firm, corporation, public performance, article, machine or merchandise whatsoever, and displayed in any manner for recognized advertising purposes.

Sign facing: The display portion of a sign.

Single-faced sign: A sign with display on one face only.

Volume of Space or Room (V_c): The volume between physical barriers which may limit the movement of fire products (e.g. fire doors in cross corridor partitions). The space shall have a maximum average length to width ratio of 4:1. If the ratio exceeds 4:1, the length of four times the average width shall be used for volume calculation. The volume of a compartment with a ratio exceeding 4:1 shall be calculated by the following formula:

$$4 \times (\text{average width of compartment})^2 \times \text{height}$$

3.0 Flame Spread Rating: All plastic sign facings shall have a flame spread rating, determined by ASTM E84, not greater than that designated as Class C interior finish by the *Building Code of the City of New York* and Class III interior finish by the *BOCA National Building Code*, for New York and New Jersey, respectively.

Exception: Materials less than 1/28-inch in thickness shall comply with the criteria in NFPA 701, "Flame Tests for Flame-resistant Textiles and Films," or when tested in accordance with ASTM D568, "Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Flexible Plastics in a Vertical Position," exhibit an average burn time for ten specimens of 15 seconds or less and a burning extent of 15 centimeters or less.

4.0 Allowable Sign Facing Area: The area of an individual plastic sign facing shall not exceed the limitations established in paragraph 4.1 through paragraph 4.6, or as calculated in accordance with the Appendix to this standard. The maximum area of all signs in a space shall not exceed 20 percent of the aggregate wall and ceiling area of the space. For multiple-faced signs, the calculated allowable area is the total area of all faces of all signs within separation distances specified in paragraph 4.7. Signs which are separated by less than the minimum sign separation distance as given in paragraph 4.7, shall be considered a single sign.

Exception: The area of an individual plastic sign facing is not limited where the portion of the building, where the sign is located, is equipped with an automatic sprinkler system. However, the 20 percent limitation, in the paragraph above, shall apply.

4.1 Polymethylmethacrylate (PMMA) (e.g., Acrylic, Plexiglass, Lucite) Sign Materials: The allowable area of a PMMA sign facing shall be determined from the following equation:

$$A_s = 0.00034 \cdot \frac{V_c}{t} \quad \left| \text{for } t \leq 0.46 \text{ inch} \right.$$

$$A_s = 0.000745 \cdot V_c \quad \left| \text{for } t > 0.46 \text{ inch} \right.$$

Example: Given a space (room or compartment) 50' long by 40' wide with a 10' high ceiling, how large a PMMA (acrylic) sign facing is allowable if PMMA is 0.25" thick?

$$A_s = 0.00034 \cdot \frac{(50)(40)(10)}{0.25} = \frac{6.8}{0.25} = 27.2 \text{ sq.ft.}$$

4.2 Polycarbonate (e.g., GE Lexan S100) Sheet Sign Material: The allowable area of a polycarbonate sign facing shall be determined from the following equation:

$$A_S = 0.00031 \cdot V_c$$

4.3 Polyethylene Teraphthalate (PET) (e.g., IMPET 300) Sign Material: The allowable area of a PET sign facing shall be determined from the following equation:

$$A_S = 0.0000759 \cdot \frac{V_c}{t} \quad \left| \text{for } t \leq 0.41 \text{ inch} \right.$$

$$A_S = 0.000185 \cdot V_c \quad \left| \text{for } t > 0.41 \text{ inch} \right.$$

4.4 Duratrans - Glossy Sign Facing Material: The allowable area of a Duratrans sign facing shall be determined from the following equation:

$$A_s = 0.000046 \cdot \frac{V_c}{t} \quad | \quad for\ t \leq 0.043\ inch$$

$$A_s = 0.00108 \cdot V_c \quad | \quad for\ t > 0.043\ inch$$

4.5 Duratrans Matte Finish Sign Facing Material: The allowable area of a Duratrans matte finish sign facing shall be determined from the following equation:

$$A_s = 0.0000224 \cdot \frac{V_c}{t} \quad | \quad for\ t \leq 0.0576\ inch$$

$$A_s = 0.000389 \cdot V_c \quad | \quad for\ t > 0.0576\ inch$$

4.6 Other Plastic Sign Materials: The allowable area of a sign facing constructed from a plastic material not listed in paragraphs 4.1 through 4.5, or from composites of plastics, shall be determined in accordance with the Appendix to this standard. The method in the Appendix may also be used for plastics listed in paragraphs 4.1 through 4.5.

4.7 Sign Separation Distances: The minimum separation distance between any two individual signs shall be in accordance with paragraphs 4.7.1., 4.7.2 and 4.7.3. Signs located less than the minimum sign separation distances apart shall be considered as one sign for allowable sign facing area.

Exception: Sign separation distances do not apply where the signs are located in a space equipped with an automatic sprinkler system.

4.7.1 Single-Faced Sign Separation Distances: The minimum separation distance between two adjacent signs with a single side of sign facing shall be 6 feet.

4.7.2 Multiple-Faced Sign Separation Distances: The minimum separation distance between two signs with multiple faces on different planes shall be 13 feet.

4.7.3 Ceiling Sign Separation Distances: Signs greater than 10 feet in length and one foot in height shall have a minimum separation distance of 10 feet, except as noted in 4.7.2. Other signs shall conform to sections 4.7.1.

4.8 Minimum Dead End Passage Width for Signs: Minimum passage width applies to dead end corridors and rooms having means of egress in locations requiring an occupant to pass by a sign. The minimum passage width shall be 20 feet in locations where an occupant must pass a single-faced sign, and 28 feet in locations where an occupant must pass a multiple-faced sign to exit. The minimum passage width (P_w) is defined as the minimum distance between an egress path and a sign, i.e., the closest an occupant will be to the sign during egress. The minimum passage width or height (for ceiling signs) where an occupant must pass by a sign which is perpendicular to the occupants path of travel shall be calculated from the following equation:

$$P_w = 0.00255 \cdot L^{3.654} \mid for\ L \geq 2\ ft$$

Exception: There is no restriction for signs less than 4 square feet in area and ceiling signs less than 2 feet long.

Appendix to Attachment A1

Calculation of Allowable Sign Area for Signs of Any Plastic Material or Composite of Plastics.

A.1 Definitions, symbols and notations: The following definitions, symbols and notations shall apply to the provisions of this Appendix (units in parenthesis are for the variable described):

A_S (ft^2) =	Allowable sign facing area
A_1 (ft^2) =	Initial allowable sign facing area based on Figure A-1
A_2 (ft^2) =	Corrected allowable sign area based on the time to burn through a sign
$\Delta H_{c,40}$ (kJ/kg) =	Heat of combustion for an incident heat flux of 40 kW/m^2
L (ft) =	The length along the ceiling of a ceiling sign
M''_{40} ($kg/s-m^2$) =	The average specimen mass loss rate of the fuel per unit area with a radiant flux exposure of 40 kW/m^2. Mass loss rate shall be determined in accordance with average horizontal specimen mass loss rate in ASTM E- 1354
P_w (ft) =	Minimum distance between an egress path and a sign. Distance can be passage width or height
t_b (sec) =	Time to burn through a specimen, used to correct allowable areas for thin signs
t (inches) =	Thickness of sign facing material(s)
V_c (ft^3) =	Volume of space or room in which the sign is located
$\sigma_{m,40}$ (m^2/kg) =	Specific extinction area, on a mass loss basis for an incident heat flux of 40 kW/m^2
ρ (kg/m^3) =	Density of sign material
SP (1/s) =	Smoke production factor used to determine uncorrected sign area based on volume

A.2 All plastic sign facings shall meet the flame spread rating criteria specified in paragraph 5.0. All test results and material properties used in the following calculations must be submitted for approval.

A.3 The allowable area of a sign facing constructed from plastic materials shall be determined in accordance with the following procedure: The procedure is applicable for all plastic materials including those listed in paragraphs 4.1 - 4.5.

1. Obtain the sample mass density ρ, in kg/m³

2. Obtain the following from ASTM E 1354:

   a) The average specimen mass loss rate per unit area under for an incident heat flux of 40 kW/m² (M''_{40}).

   b) The average specific extinction area for an incident heat flux of 40 kW/m² ($\sigma_{m,40}$).

   c) The average effective sample heat of combustion for an incident heat flux of 40 kW/m² ($\Delta H_{C,40}$).

3. Calculate the material's smoke production factor (SP)

$$SP = \sigma_{m,40} \cdot M''_{40}$$

4. Using Figure A-1 and the appropriate values of SP and V_C, estimate the value of A_1.

5. The initial corrected allowable area of a combustible sign facing (A_2) based on the thickness of the material shall be calculated using the following formulas:

$$A_2 = \frac{600}{t_b} \cdot A_1$$

where t_b is determined by the following formula:

$$t_b = 0.0254 \cdot \frac{\rho \cdot t}{M''_{40}}$$

Exception: If t_b is greater than 600, then a corrected area is not required, i.e., $A_2 = A_1$.

6. The final allowable area of a combustible sign facing (A_s) based on the heat release rate properties of the combustible materials shall be calculated using the following formula:

$$A_s = \frac{452}{M''_{40} \cdot \Delta H_{c,40}} \cdot A_2$$

Exception: If $M''_{40} \cdot \Delta H_{c,40}$ is less than 452.0 kW/m², a corrected area is not required, i.e., $A_S = A_2$.

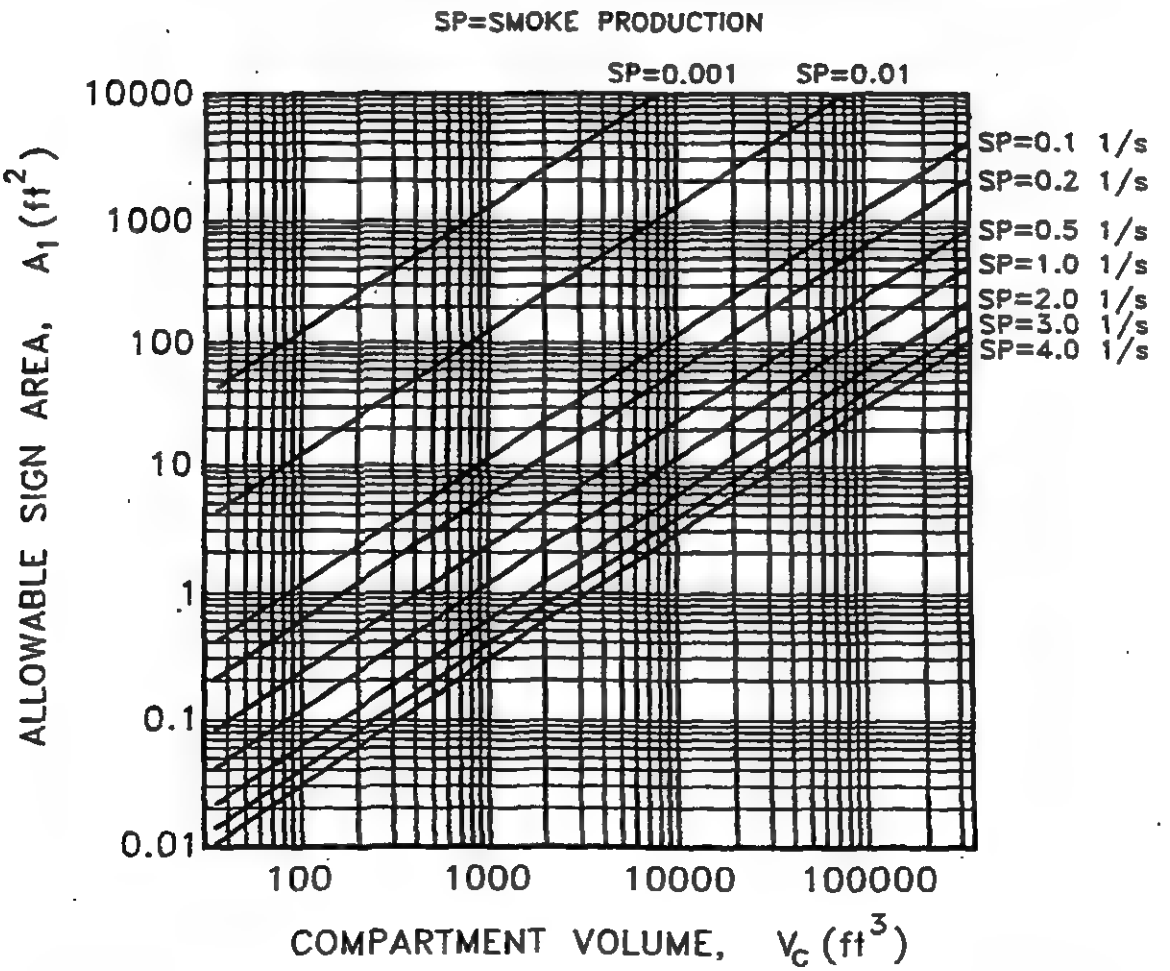


Figure A-1

Allowable Sign Area as a Function of the Smoke Production and Room Volume

7. Allowable facing area of composite sign materials shall be determined in the same fashion as signs with single materials. Material properties of the composite sign (M''_{40}, σ_m, ΔH_c, ρ) shall be a weighted average of each component mass material. For example, material properties of a composite with two materials shall be determined via

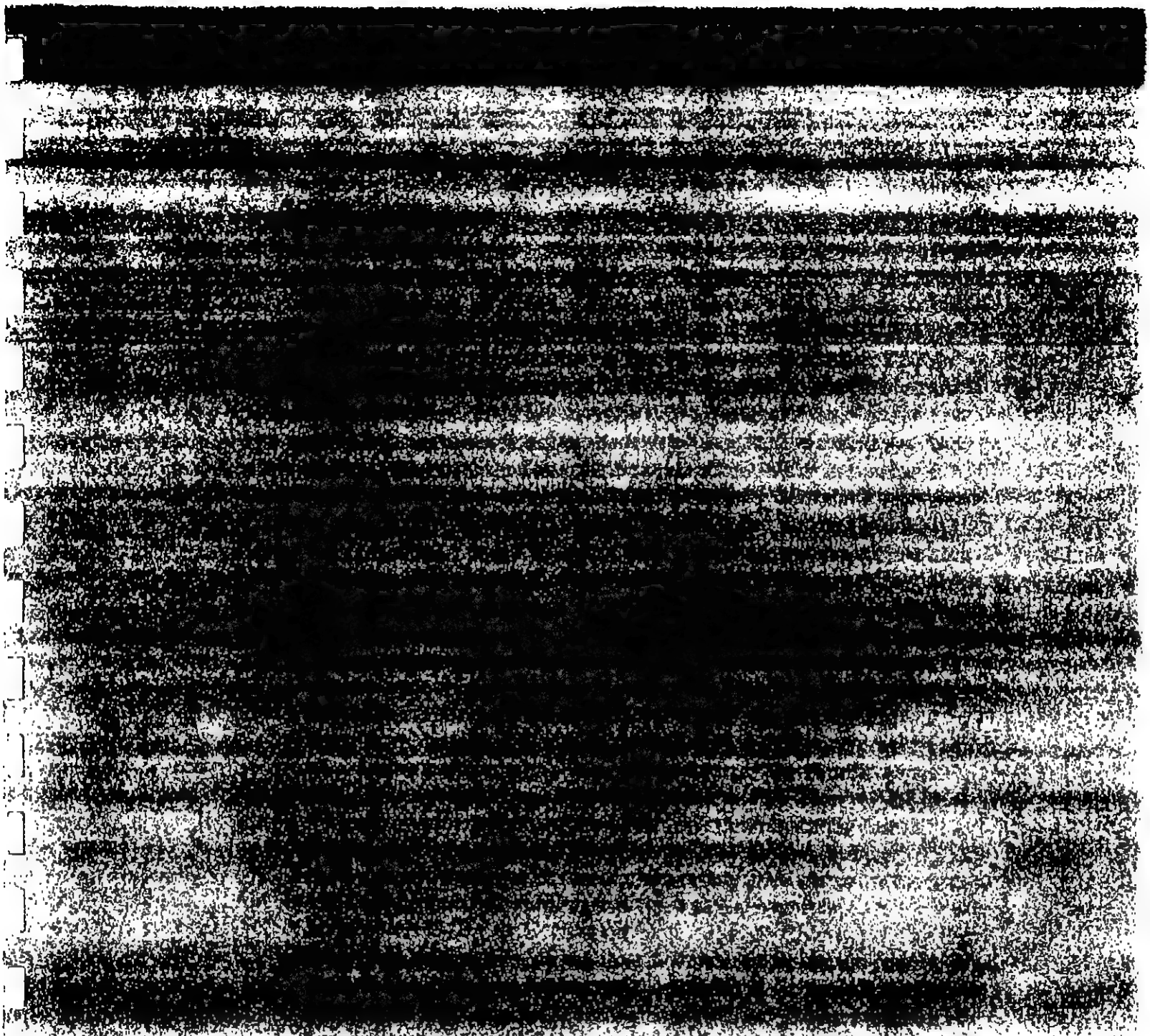
$$M''_{40} = \frac{mass_1}{mass\ total} \cdot M''_{40,1} + \frac{mass_2}{mass\ total} \cdot M''_{40,2}$$

$$\sigma_m = \frac{mass_1}{mass\ total} \cdot \sigma_{m,1} + \frac{mass_2}{mass\ total} \cdot \sigma_{m,2}$$

$$\Delta H_c = \frac{mass_1}{mass\ total} \cdot \Delta H_{c,1} + \frac{mass_2}{mass\ total} \cdot \Delta H_{c,2}$$

$$\rho = \frac{mass_1}{mass\ total} \cdot \rho_1 + \frac{mass_2}{mass\ total} \cdot \rho_2$$

where 1 and 2 refer to materials number one and two.



ATTACHMENT A2

SPECIFICATIONS GOVERNING THE FLAMMABILITY OF DRAPERY AND CURTAIN MATERIALS IN UNSPRINKLERED AREAS

A. All drapery and curtain materials, including linings, shall be subject to the vertical flame tests as required by Federal Aviation Regulation FAR 25.853(a) and Appendix F, revised February 2, 1995.

The test method requires that the flame shall be applied for 12 seconds and then removed, that the average char length shall not exceed eight (8) inches, that the average flame time after removal of the flame specimen shall not continue to flame for more than five (5) seconds after falling.

B. The manufacturer of the finished item shall submit written certification for each component fabric of the completed items as follows:

1. If the material contains 100% fibers that are inherently flame resistant by virtue of the physical properties of the untreated fiber, a written certification by a recognized independent testing laboratory, attesting to the permanent flame resistant properties of all the fibers within, shall be submitted to the Port Authority.

2. If the material contains fibers which are not inherently flame resistant in the untreated state, a written certification by a recognized independent testing laboratory shall be submitted to the Port Authority, attesting that the treated materials have maintained their flame resistant properties, as determined by the burn test in paragraph A above, after five (5) washings and/or dry cleanings. The washing test procedure shall be performed as defined by the Technical Manual of the American Association of Textile Chemists and Colorists (AATCC) Test Method 124-1978 using the wash temperature of 120° ±5°F and the "Tumble Dry" procedure. The dry cleaning test procedure shall be performed by subjecting the material to dry cleaning in a "Coin-OP" machine as manufactured by Norge or Wastinghouse or an equal machine. The size sample of material and the machine size are to be commensurable to each other. When necessary, dummy pieces of material shall be added to the test specimens to make up a load equal to the machine rating.

ATTACHMENT A3

SPECIFICATIONS GOVERNING THE FLAMMABILITY OF UPHOLSTERY MATERIAL AND PLASTIC FURNITURE IN UNSPRINKLERED AREAS

A. All upholstery materials, including covering, interliner, lining, webbing, cushioning, and padding shall be subject to the vertical flame test as required by Federal Aviation Regulation FAR 25.853(a) and Appendix F, revised February 2, 1995.

The test method requires that the flame be applied for 12 seconds and then removed, that the average burn length shall not exceed eight (8) inches, that the average flame time after removal of the flame source shall not continue to flame for more than an average of five (5) seconds after falling.

Test samples subject to the vertical test shall be tested using the thickness of the material as used in the finished product; except that, the maximum thickness of a test sample shall be one-half inch (1/2") in cases where the final product material exceeds that thickness.

B. Padding that exceeds one-half inch (1/2") thickness and all cushioning, in addition to meeting the requirements of Section A above, shall be tested in accordance with the Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source - ASTM E162-94. Wire mesh screen and aluminum foil shall be used as indicated in Section 5.8.1 of this standard test method.

1. Padding and cushioning with a flame propagation index not exceeding 100 is acceptable for use with an external covering that meets the requirements of Section A of this specification.

2. Padding and cushioning with a flame propagation index exceeding 100 may be covered with materials or interliners complying with paragraph A of this specification. However, the final assembly of these materials which make up the cushion, arm rest, or other parts of the furniture, shall be subject as a composite unit to Standard Test Method ASTM E162-94. Composite assemblies with a flame spread index not exceeding 100 will be acceptable.

C. All self-supporting plastic materials shall be subject to the vertical flame test as required by FAR 25.853(a) and Appendix F. The test

method requires that the flame be applied for 60 seconds and then removed, that the average burn length shall not exceed six (6) inches, that the average flame time after removal of the flame source shall not exceed 15 seconds, and that drippings from the test specimens shall not continue to flame for more than an average of three (3) seconds after falling.

D. The thickness of the materials and of the composite assemblies tested under paragraphs B land C above shall be the same as the thickness used in the finished item. Certification submitted by the manufacturer shall indicate the thickness of the materials as tested.

E. The manufacturer of the finished item shall submit a certification by a recognized, independent, testing laboratory of the results of the tests specified above and of the service life of the flame retardancy of a treated material or a certification that the flammability characteristics of the material are inherent therein by virtue of the chemical properties of the material. Treated material may be used only when the certified flame retardant service life exceeds that of the planned service life of the finished item.

ATTACHMENT A4

SPECIFICAITONS GOVERNING THE FLAMMABILITY OF PLASTIC LAMINATE AND WOOD VENEER FURNITURE IN UNSPRINKLERED AREAS

A. Test and Criteria:

1. Flame spread indices for this specification shall be determined by either ASTM-E-84 or ASTM-E162. Flame spread indices shall not exceed 25.

2. The vertical flame test shall be performed in accordance with Federal Aviation Regulation, FAR 25.853(a) and Appendix F, revised February 2, 1995. This test method requires that the flame be applied for 12 seconds and then removed, that the average burn length shall not exceed eight (8) inches, that the average lame time after removal of the flame source shall not exceed 15 seconds, and that drippings from the test specimen shall not continue to flame for more than five (5) seconds after falling.

B. Free Standing Office Partitions:

1. All core and/or structural materials shall be tested and meet the requirements specified in A.1 above.

2. All insulation and covering materials shall be tested and meet the requirements specified in A.2 above.

C. Desk, Tables, Credenzas, Bookcases, etc.:

1. All core and/or structural materials shall be tested and meet the requirements specified in A.1 above.

2. Plastic laminate or wood veneer layer materials having a thickness not greater than 1/28 inch shall be tested and meet the requirements specified in A.2 above.

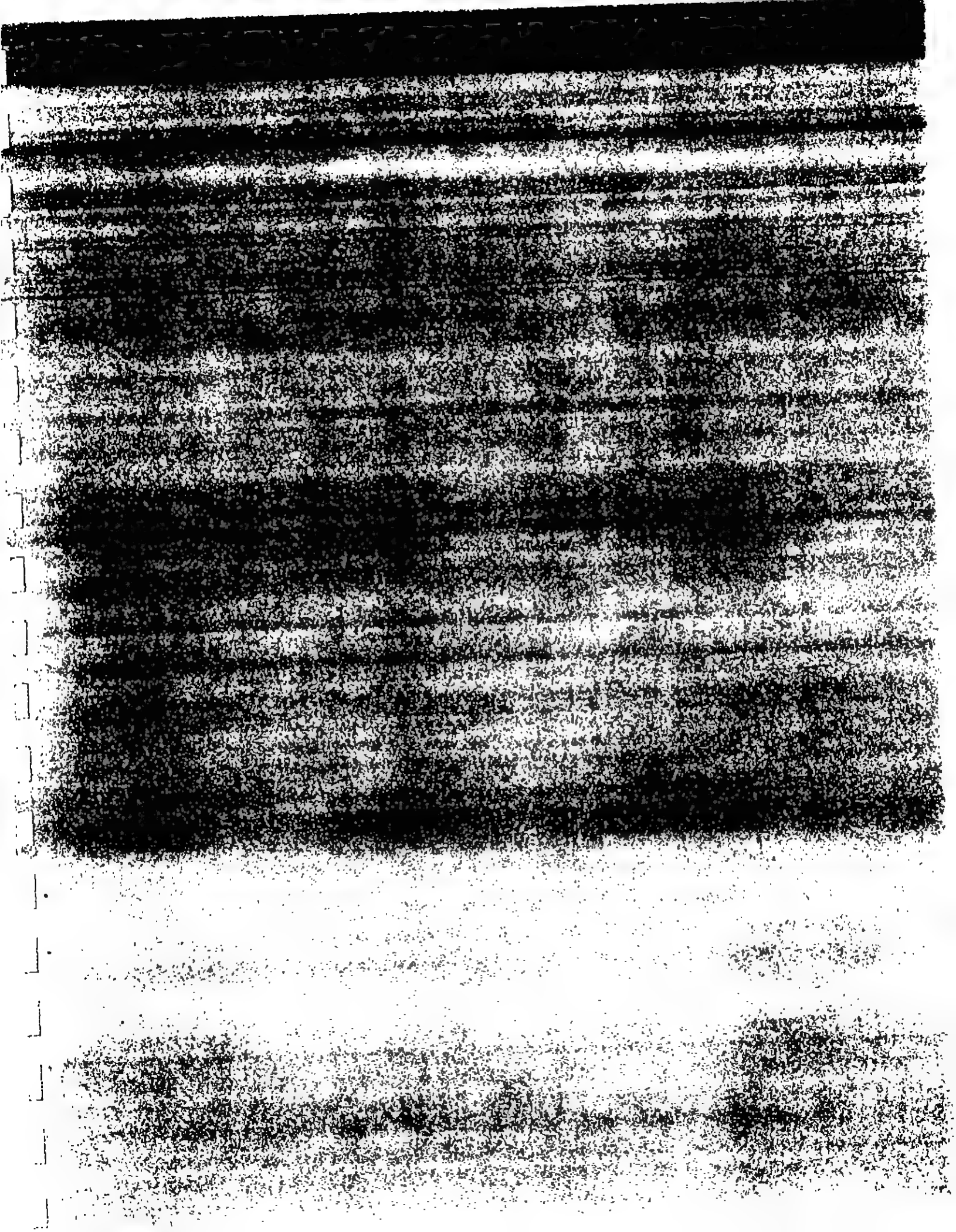
3. Plastic laminates or veneer layer materials having a thickness greater than 1/28 inch shall be subject to vertical flame test as per

Federal Aviation Regulation, FAR 25.853(a) or (c), and Appendix F determined by the P.A.'s Risk Management Division.

4. The application of intumescent coatings to achieve fire resistance shall be reviewed by the P.A.'s Risk Management Division.

D. Certification:

The supplier of the finished item shall submit a certification and test data by a recognized independent testing laboratory of the results of the tests specified above. The certification and tests shall cover the materials supplied in the finished product. Proof of use of U.L. labeled products meeting the specified flammability criteria will be accepted in lieu of the certification.



THE PORT AUTHORITY OF NY & NJ

MEMORANDUM

TO: Eugene J. Fasullo, P.E., Director of Engineering & Chief Engineer
FROM: Oscar Suros
DATE: August 8, 1995
SUBJECT: **SEISMIC DESIGN - NEW YORK CITY BUILDING CODE**

COPY TO: A. Aronowitz, A. Brociner, J. Buchsbaum, R. Davidson, J. Englot, J. Kelly, T. Kelly, F. Lombardi, E. Ramabhushanam, EPMs

REF: Memo, Vanacore to Directors, October 4, 1988 and
Memo, Suros to Fasullo, June 7, 1994

THE PORT AUTHORITY OF NY & NJ
QUALITY ASSURANCE DIV.
ENGINEERING DEPT.
AUG 1 1995
RECEIVED
NOTED: _____
REFERRED TO: _____

As established by the referenced memoranda, it has been our policy to design building structures and building components for seismic effects in both New Jersey and New York using the BOCA National Building Code. Recently the New York City Council and the Mayor enacted Local Law #17/95 providing requirements for seismic design of buildings and their components. This law adds provisions to the New York City Building Code that will be mandatory for all building or alteration applications filed on or after February 21, 1996.

Your approval is requested to start using the recently enacted changes to the New York City Building Code for all construction in New York City, including the revisions listed in Attachment A, effective immediately. The BOCA National Building Code will continue to be used for New Jersey and Yonkers construction.

The revisions in Attachment A are required in order to meet the stated intent of the seismic revisions to the New York City Building Code. This will insure that potential overhead hazards will not fall on building occupants as a result of a

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seismic event and that the building can be safely evacuated during and immediately following a seismic event. Similar provisions are included in the BOCA Code and are considered minimum requirements. No significant cost penalty is estimated due to the minor modifications included in Attachment A.

Oscar Suros, P.E.
Manager
E/A Design Division

APPROVED:

Director of Engineering &
Chief Engineer

Attachments

OS:cep

ATTACHMENT A

Revisions to the New York City Building Code

Revise Table No. 23-P of RS 9-6 by:

(a) Adding after II. 1. b.
"c. Overhead Signs . . . . . 2.00";

(b) Adding after II. 3.
"4. Anchorage for suspended ceilings weighing more than 4 psf without the weight of light fixtures . . . . 0.75";

(c) Adding after III. 1.
"2. Elevator and counterweight guardrails and supports . . . 1.25"
"3. Sprinkler piping[5] . . . . . 2.00"
"4. Gas and high hazard piping. . . . . 2.00"
"5. Other piping[6] . . . . . 0.67"
"6. HVAC ducts[6] . . . . . 0.67"

(d) Adding the following notes after note 4. at the bottom of the table:
"5. The design of seismic restraints for sprinkler piping in compliance with NFPA 13 using a design acceleration of 0.15 is acceptable in lieu of compliance with these provisions.
6. Seismic restraints are not required for any of the following conditions for other pipe systems or HVAC ducts:

1. Piping or ducts suspended by individual hangers 12 inches or less in length from the top of the pipe or duct to the supporting structure.
2. Piping in boiler and mechanical rooms which has less than 1 1/4 inches inside diameter.
3. Piping in other areas which has less than 2 1/2 inches inside diameter.
4. Ducts which have a cross-section area less than 6 square feet."

Table No. 23-P

HORIZONTAL FORCE FACTOR C_p[1]

ELEMENTS OF STRUCTURES, NONSTRUCTURAL COMPONENTS AND EQUIPMENT	*VALUE OF C_p*
I. Part of Portion of Structure	
1. Walls, including the following:	
a. Unbraced (cantilevered) parapets.	*2.00*
b. Other exterior walls above street grade [2].	*0.75*
c. All interior bearing walls.	*0.75*
d. All interior nonbearing walls and partitions around vertical exits, including offsets and exit passageways.	*0.75*
e. Nonbearing partitions and masonry walls in areas of public assembly > 300 people.	*0.75*
f. All interior nonbearing walls and partitions made of masonry in Occupancy I, II and III.	*0.75*
g. Masonry or concrete fences at grade over 10 feet high.	*0.50*
2. Penthouses (defined in article 2 of subchapter 2 of chapter 1 of title 27 of the building code) except where framed by an extension of the building frame	*0.75*
3. Connections for prefabricated structural floor and roof elements other than walls (see above) with force applied at center of gravity.	*0.75*
4. Diaphragms[3].	
II. Nonstructural Components	
1. a. Exterior ornamentation and appendages including cornices, ornamental statuaries or similar pieces of ornamentation.	*2.00*
b. Interior ornamentation and appendages in areas of public assembly including cornices, ornamental statuaries or similar pieces of ornamentation.	*2.00*
2. Chimneys, stacks, trussed towers and tanks on legs.	
a. Supported on or projecting as an unbraced cantilever above the roof more than one-half its total height.	*2.00*
b. All others, including those supported below the roof with unbraced projection above the roof less than one-half its height, or braced or guyed to the structural frame at or above its center of mass.	*0.75*
3. Exterior signs and billboards.	*2.00*
III. Equipment and Machinery [4]	
1. Tanks and vessels (including contents), including support systems and anchorage.	*0.75*

Notes:

1. See Section 2312(g)2 for additional requirements for determining C_p for nonrigid equipment or for items supported at or below grade.

2. See Section 2312(h)2D(iii) and Section 2313(g)2.

3. See Section 2312(h)2I.

4. Equipment and machinery include such items as pumps for fire sprinklers, motors and switch gears for sprinkler pumps, transformers and other equipment related to life-safety including control panels, major conduit ducting and piping serving such equipment and machinery.

ATTACHMENT S3

MODIFICAITONS TO THE NEW YORK CITY BUILDING CODE EARTHQUAKE LOADS

Revise Table No. 23-P of RS 9-6 by:

a. Adding after II.1.b.
"c. Overhead Signs .. .. 2.00";

b. Adding after II.3.
"4. Anchorage for suspended ceilings weighing more than 4 psf without the weight of light fixtures .. .. .. 0.75";

c. Adding after III.1.
"2. Elevator and counterweight guardrails and supports 1.25"

"3. Sprinkler piping[5] .. .. 2.00"

"4. Gas and high hazard piping .. .. .. 2.00"

"5. Other piping[6] .. .. 0.67"

"6. HVAC ducts[6] .. .. 0.67"

d. Adding the following notes after Note 4 at the bottom of the table:

"5. The design of seismic restraints for sprinkler piping in compliance with NFPA 13 using a design acceleration of 0.15 is acceptable in lieu of compliance with these provisions.

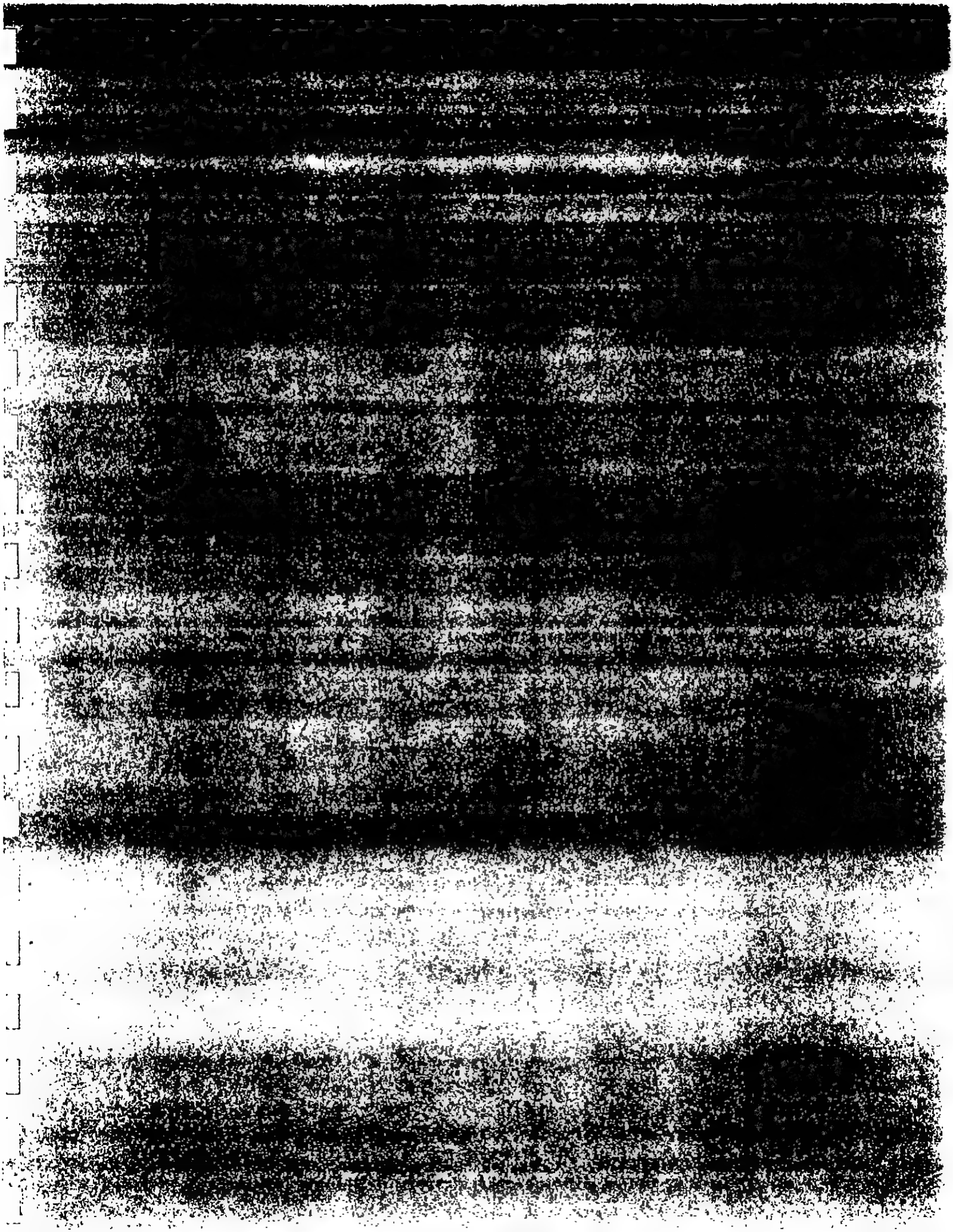
6. Seismic restraints are not required for any of the following conditions for other pipe systems of HVAC ducts:

i. Piping or ducts suspended by individual hangers 12 inches or less in length from the top of the pipe or ducts to the supporting structure.

ii. Piping in boiler and mechanical rooms which has less than 1-1/4 inches inside diameter.

iii. Piping in other areas which has less than 2-1/2 inches inside diameter.

iv. Ducts which have a cross-section area less than 6 square feet."



THE PORT AUTHORITY OF NEW YORK & NEW JERSEY

RECEIVED

MEMORANDUM

97 SEP 24 P 2:33

TO: Karen Antion, Chief Technology Officer
FROM: Francis J. Lombardi
DATE: August 20,1997
SUBJECT: POLICY ON THE USE OF PVC INSULATED WIRING AND CONDUITS
Reference: 1) Memorandum, R.M. Monti to J.L.Vanacore, July 23, 1987
2) Memorandum, E.J. Fasullo to J.L.Vanacore, April 3, 1992

COPY TO: D. Bergstein, AP. Blanco, D. Feeley, J. Green, M. Hatfield, R. Lobron, C. McClafferty, C. Russell, All Department and Office Directors

The referenced policy decision (Reference Memorandum 1) prohibits the use of PVC insulated wiring and conduits, within buildings, for all construction on Port Authority property, and for construction financed in whole or part by the Port Authority. The only exception (Reference Memorandum 2) has been for power limited circuits used for communication, control and signaling circuits.

Over the last number of years, the wiring and cable industry has made improvements to the design and manufacturing of cable insulation systems, to the extent that the reasons for banning the use of PVC insulated cable in the past no longer apply.

Therefore, it is recommended that the PVC policy be modified to no longer prohibit the use of PVC insulated wire and cable where they are designed and constructed in accordance with applicable codes and standards. The use of PVC conduit should still be prohibited in buildings.

The PVC ban will continue to apply for the Lincoln, Holland and PATH tunnels, since the Port Authority follows NFPA - 502 and NFPA 130, which both state that PVC conduit and insulated/jacketed wires or cables should not be used in tunnels.

RECOMMENDED: _____
Jack Buchsbaum, P.E., Chief Electrical Engineer

CONCURRED: NC _____
Frank Lombardi, P.E., Chief Engineer

APPROVED: _____
Karen Antion, Chief Technology Officer

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY

M E M O R A N D U M

TO: Joseph L. Vanacore, Assistant Executive Director/Capital Programs
FROM: Eugene J. Fasullo
DATE: April 3, 1992
SUBJECT: POLICY ON THE USE OF PVC INSULATED WIRING AND CONDUITS
REFERENCE: 1) Memorandum, R.M. Monti to J.L. Vanacore, July 23, 1987
2) Memorandum, R.J. Linn to J. Carlock, et al - August 5, 1987

COPY TO: F. Garcia, R. Kelly, L. Liburdi, C. Maikish, D. Plavin, A. Shorris

The referenced policy decision (Reference Memorandum 1) prohibits the use of PVC insulated wiring and conduits, within buildings, for all construction on Port Authority property, and construction financed in whole or part by the Port Authority.

This policy was interpreted by the World Trade Department (Reference Memorandum 2) to apply to PVC conduits and to insulated power wiring only. Therefore, Communications and Remote Signaling Cables have been excluded from the PVC prohibition in the World Trade Center and the Teleport.

In the last few years the wiring and cable industry achieved important advances in the technology and manufacturing of new insulations for wiring used in Communication Systems and Remote Control, Signaling, and Power Limited Circuits. These insulations now have enhanced qualities that are "resistant to the spread of fire" and have "low smoke producing characteristics". The National Electrical Code, in its latest edition of 1990, recognizes the qualities of these insulations, lists them for the purpose of their application, mandates that they be distinctly marked and defines the testing methods and procedures.

These cables are readily available, can be supplied by numerous manufacturers, and can be used to conform to the current code requirements.

In view of the above, we recommend that the PVC prohibition not apply to wiring used in Communication Systems and Remote Control, Signaling, and Power Limited Circuits. All wiring for such systems should be governed by the applicable codes.

RECOMMENDED: _____
Jack Buchsbaum, Chief Electrical Engineer

CONCURRED: _____
E.J. Fasullo, Director of Engineering & Chief Engineer

APPROVED: _____
J. L. Vanacore, Deputy Executive Director/Capital Programs

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY

MEMORANDUM

To: Joseph L. Vanacore, Asst. Executive Director/Capital Programs
From: R.M. Monti
Date: July 23, 1987
Subject: POLICY ON THE USE OF PVC INSULATED WIRING AND CONDUITS

Copy: R. Aaronson, A. Barber, P. Falvey, S. Frigand, L. Gambaccini, C. Hirsch, R. Kelly, J. Kirk, P. LaRocco K. MacKay, H. O'Neill, D. Plavin, V. Strom

In attempting to maintain the highest possible level of safety and integrity, the Engineering Department has prohibited the use of PVC insulated wiring and conduits, within buildings, for Port Authority designed and constructed projects for over 20 years. I recommend that this policy include all construction on Port Authority property and construction financed in whole or part by the Port Authority.

The primary concern with these products has been their physical limitations at extreme temperature and under pressure. At low temperature exposures, below 32 degrees F, PVC becomes brittle, while when exposed to high temperatures, over 104 degrees F, it is subject to deformation. PVC is also subject to deformation due to pressure during typical installation procedures at normal temperatures. Because of the loss of these physical properties, the insulation of the conductor may be damaged when installed in conduit. As a result, the conductor may be subject to premature electrical faults, which can cause electrical system malfunctions, interruption of service and ultimately loss of system reliability.

Given these physical disadvantages and in view of the fact that alternate products are readily available, PVC insulated wiring and conduits are not to be used within buildings in Port Authority and Tenant construction installations. The economic impact of this policy may be approximately 5% increase in the cost of the electrical wiring material. When evaluated on a total project basis, the cost is not significant compared with the potential benefits derived.

If it is determined that conformance to this policy is not possible, exceptions may be considered. Such exceptions shall be permitted only if the Line Department Director, who proposes such a course of action, obtains the approval of the Chief Engineer, General Counsel, and the Assistant Executive Director/Capital Programs.

RECOMMENDED: _____
R.M. Monti, Director of Engineering & Chief Engineer

CONCURRED: _____
J.L. Vanacore, Asst. Executive Director/Capital Programs

APPROVED: _____
S. Berger, Executive Director

5. For fire detection and alarm requirements see Section 12 of this Manual.

6. For aircraft loading walkway requirements see Section 13 of this Manual.

7. For fire shutters in conveyor systems see Section 5 of this Manual.

8. PVC conduits and PVC insulation for wiring other than that for communications systems or remote control, signaling, or power limited circuits shall not be used above ground within buildings except as expressly permitted in this manual in specific applications.

B. High-Tension Power, New York Airports:

1. The incoming service shall be designed with a minimum of two (2) feeders, with automatic switch-over operation. The service shall be either:

   a) Primary Selective
   b) Secondary Selective
   c) Primary and Secondary Selective
   d) Spot Network

2. Primary selective switchgear shall be arranged with a mechanically interlocked tie switch to allow one feeder to supply the entire load.

3. Each incoming service switch shall be provided with a grounding switch, arranged to ground the incoming feeder (line side of switch). Interlocks shall be provided to prevent closing the grounding switch if the feeder is energized. The interrupting rating shall be 270MVA for JFK International Airport and 180MVA for LaGuardia Airport.

4. All incoming feeder cables shall be lead sheathed, EPR insulated (133% insulation level), copper conductor and polyethylene jacketed cable. Cables shall be manufactured by a factory approved by Con Edison. Splice kits shall be

C. World Trade Center: See the published W.T.C. guidelines for HVAC and Fire Safety systems.

D. General:

1. PVC piping shall not be used above ground within buildings. ←

2. All new escalators in New Jersey shall have a comb plate impact device with a vertical element setting of 45 pounds for escalator width up to 32 inches and 60 pounds for escalators wider than 32 inches and a horizontal setting of 112 pounds at either side or 225 pounds at center plate. Also, all new escalators in New York and New Jersey shall have the trailing wheels within the width of the steps or shall have two undercarriage rail type supports for the full length of the escalator.

V. DETAILS OF MECHANICAL REVIEW

The following are representative of items reviewed:

A. The review shall extend to existing code violations in areas affected by the work.

B. In reviewing a proposed project, particular attention shall be given to:

1. General system design.

2. Coordination of all new work with existing conditions.

3. Review of materials, operating and safety controls, equipment approval.

4. Requirements for system and equipment testing and inspection.

C. Work affecting the Aviation Fuel Servicing systems and Central Heating and Refrigerating Systems, including additional load

2. The National Standard Plumbing Code as amended by NJUCC.

3. BOCA National Building Code.

4. BOCA National Mechanical Code, as amended by NJUCC, where applicable (gas piping, etc.).

5. BOCA National Fire Prevention Code.

6. BOCA National Energy Conservation Code as amended by NJUCC.

7. The Supplements and Reference Standards of the Codes.

C. City of Yonkers:

1. Prior to 6/2/89: The Codes of the City of Yonkers.

2. After 6/2/89: New York State Uniform Fire Prevention and Building Code.

III. STANDARDS

A. See Sections 8 and 12 of this Manual.

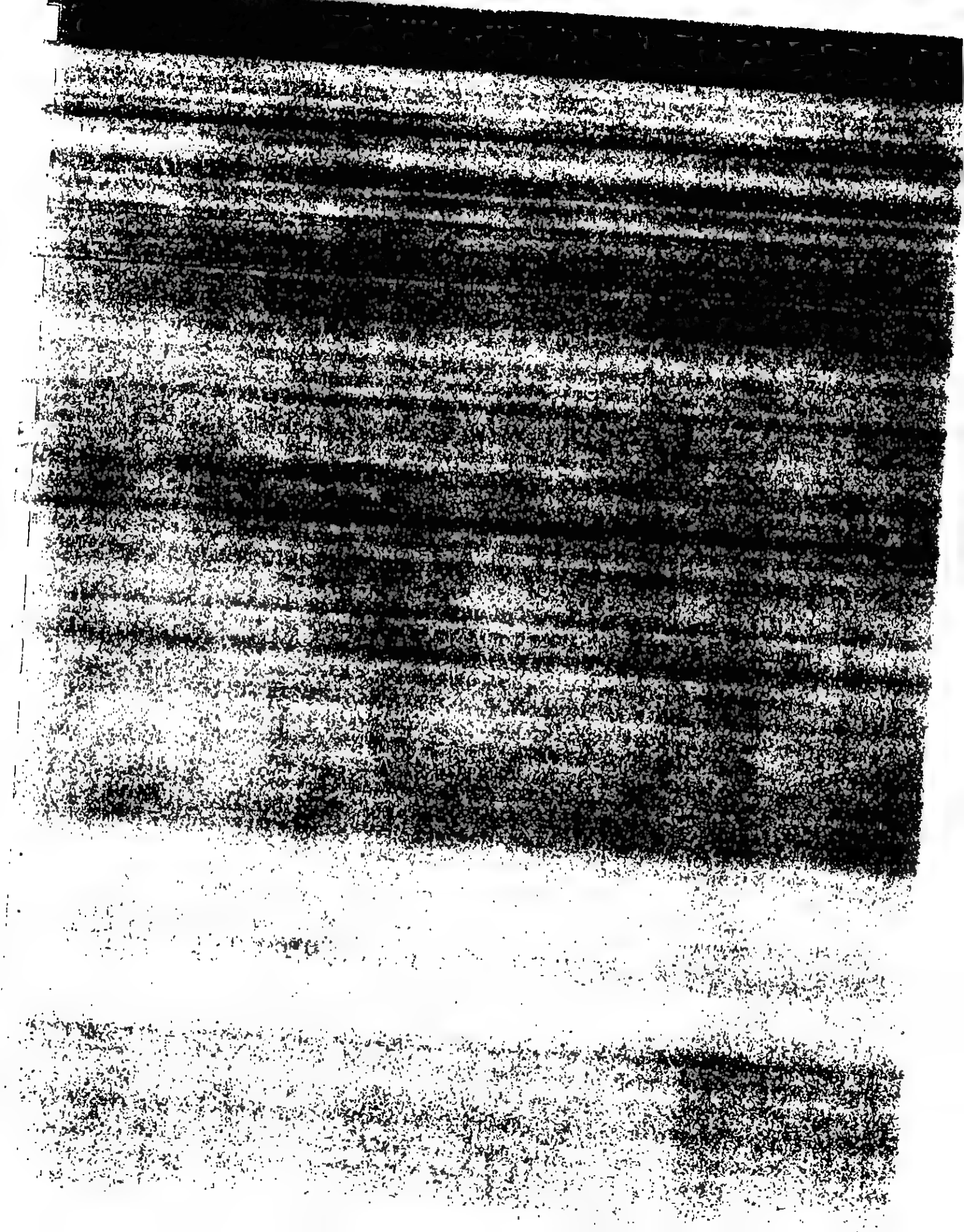
B. National Sanitation Foundation approval for Kitchen equipment.

IV. PORT AUTHORITY DESIGN CRITERIA

A. General:

1. PVC piping shall not be used above ground within buildings.

2. Fire standpipe hose shall be approved 100% - synthetic single jacket fire hose.



ATTACHMENT M1

PORT AUTHORITY BUS TERMINAL TENANT HVAC DESIGN CRITERIA

The following Design Criteria shall be used to properly size and design Tenant HVAC and smoke purge systems to meet the Port Authority (PA) Standards for the Bus Terminal.

A. GENERAL

1. The tenant HVAC systems are to be designed so that conditioned air is not taken from air conditioned public spaces.

2. The Tenant shall provide complete automatic temperature controls to control the space conditions in his area.

3. Chilled water will be shut down during the winter season.

4. Heating hot water for HVAC will be shut down during the summer season.

5. Steam for HVAC will not be provided during the summer season.

6. A time clock shall be provided for off-hours A.C. shutdown by the Tenant.

7. The Tenant shall furnish and install automatic dampers for temperature control and smoke purge requirements.

B. OUTSIDE AIR

A duct will provide each leasehold with outside air, filtered and preheated to 37°F minimum, if required. The final design criteria for the use of outside air shall be:

1.	Minimum	0.30 cfm/sf
2.	Maximum	1.2 cfm/sf
3.	Supply Pressure at connection to PA duct	Not less than 0.00 inches water

C. SPILL AIR

A spill air duct connection will be provided for each leasehold not having direct access to spill air discharge louvers, allowing for the carrying away and discharge of spill air directly to the outdoors.

Spill air CFM should equal outside air CFM less any local exhaust, and an exfiltration allowance of approximately 10% of supply air quantity.

Return or spill air fan shall be sized to satisfy the smoke purge requirements as described hereinafter under Smoke Purging; otherwise, a separate smoke purge system, including a dedicated smoke purge exhaust fan, shall be provided by the Tenant.

D. CHILLED WATER

Valved supply and return connections will be provided by the PA with a cooling capacity as follows: To maintain leasehold at 78°F, 50% RH, with 0.30 cfm/sf outside air at 91°F DB, 75°F WB, 6 watts/sf electrical load, 50 sf/person occupancy, plus solar exposure and transmission heat gain, where such exists.

Chilled water temperature: Supply is 45°F, return is 60°F. Available pressure differential between supply and return is 12 psi, and working pressure is 125 psig. The Control valve shall be two-way modulating type and valve operations shall be sized to shut the valve against a 50 psig differential. Tenant shall provide the drain piping necessary to carry the cooling coil condensate from his A/C equipment, for spillage into Tenant's own drain facility.

E. STEAM (SOUTH WING ONLY)

A valved connection for steam will be provided by the PA with 15 psig at the point of connection. A valved connection at the PA's condensate return line will also be provided by the PA for connection by the Tenant.

F. HEATING HOT WATER (NORTH WING ONLY)

Valved supply and return connections will be provided by the PA as follows:

To provide heating capacity for the Tenant HVAC system such that a leasehold is maintained at 70°F indoor temperature, with 5°F outdoor.

Heating hot water range is 180°F supply 140°F return.

Available pressure differential between supply and return is 6 psi, working pressure is 125 psif. Control valve shall be two-way modulating type, and valve operator shall be sized to shut the valve against a 50 psig differential pressure.

A baseboard radiation heating system is provided for leasehold(s) exposed to the outdoors, sized to maintain a 50°F minimum leasehold, with 5°F outdoors, when the Tenant HVAC system is not operating.

G. SMOKE PURGING

1, Fan Capacity:

The Tenant shall install a new exhaust fan to provide exhaust at a minimum of 1.5 cfm/sf or 6 air changes per hour, whichever is greater, for a store with a closed storefront, or a minimum 200 FPM velocity through an open storefront leading to the public areas, when the smoke purge is automatically or manually activated.

2. Equipment:

a. The entire smoke purge system, including exhaust fan, damper, discharge louver, duct connection to outdoors, etc., shall be furnished and installed by the Tenant.

b. Where applicable, and if adequate size is available, the existing spill air duct may be utilized as a smoke purge exhaust duct. Connection to existing spill air duct shall be provided by the tenant.

3. When the return air fan is used for smoke purge, the Tenant shall provide all necessary motorized dampers in spill and return air ducts.

4. Concourse-to-Tenant Space Make-up Air Transfer Duct:

The tenant shall provide transfer duct with backdraft damper, to permit flow of make-up air from the concourse to the tenant space during smoke purge operation. Fire damper/smoke damper shall be provided, as per Code, in the transfer duct.

H. TEMPERED OUTSIDE AIR SUPPLY

A capped connection is provided from a tempered (37°F) air duct, located in the concourse ceiling. Tenant shall furnish and install all ductwork from this connection to his A/C equipment.

I. ELECTRICAL WIRING

Refer to Attachment E1 for electrical wiring requirements for HVAC.

J. SMOKE DETECTORS

1. The Tenant shall provide smoke detectors in the return air duct, as well as downstream of the filters in the air handling unit supply duct. In addition, the Tenant shall provide area smoke detectors on the basis of a minimum of one (1) area detector per 900 sf. For requirements of duct and area smoke detectors refer to Attachment E1.

2. HVAC and Area Smoke Detectors shall:

   a. Provide an audio-visual signal at the Local Control Panel, specified herein in Attachment E1.

   b. Activate the smoke purge mode of the Tenant's A.C. system.

K. HVAC CONTROL - SMOKE PURGE MODE

1. Automatic Smoke Purge Cycle:

Upon activation of an HVAC or area smoke detector, an alarm shall be initiated, the supply air fan shall stop, the outside air and return air dampers shall close, the spill air damper shall open fully, and the return air fan, if designated as a smoke purge fan, shall keep running; otherwise it shall also stop, and the dedicated smoke purge fan shall start, bypassing all other controls.

In the event that activation of the area smoke detector(s) occurs at night when the A.C. system is off, the return air fan, if designated as a smoke purge fan, or the dedicated smoke purge fan shall start, and the dampers shall be positioned as described above.

2. Manual Smoke Purge Cycle:

   a. Local Manual Control shall originate from the Local Control Panel, specified in Attachment E1.

   b. Provision shall also e made for accomplishing the Tenant's smoke purge cycle remote-manually from the Manual Pull Station, specified herein in Attachment E1.

L. LOCAL CONTROL PANEL AND EMERGENCY POWER SUPPLY

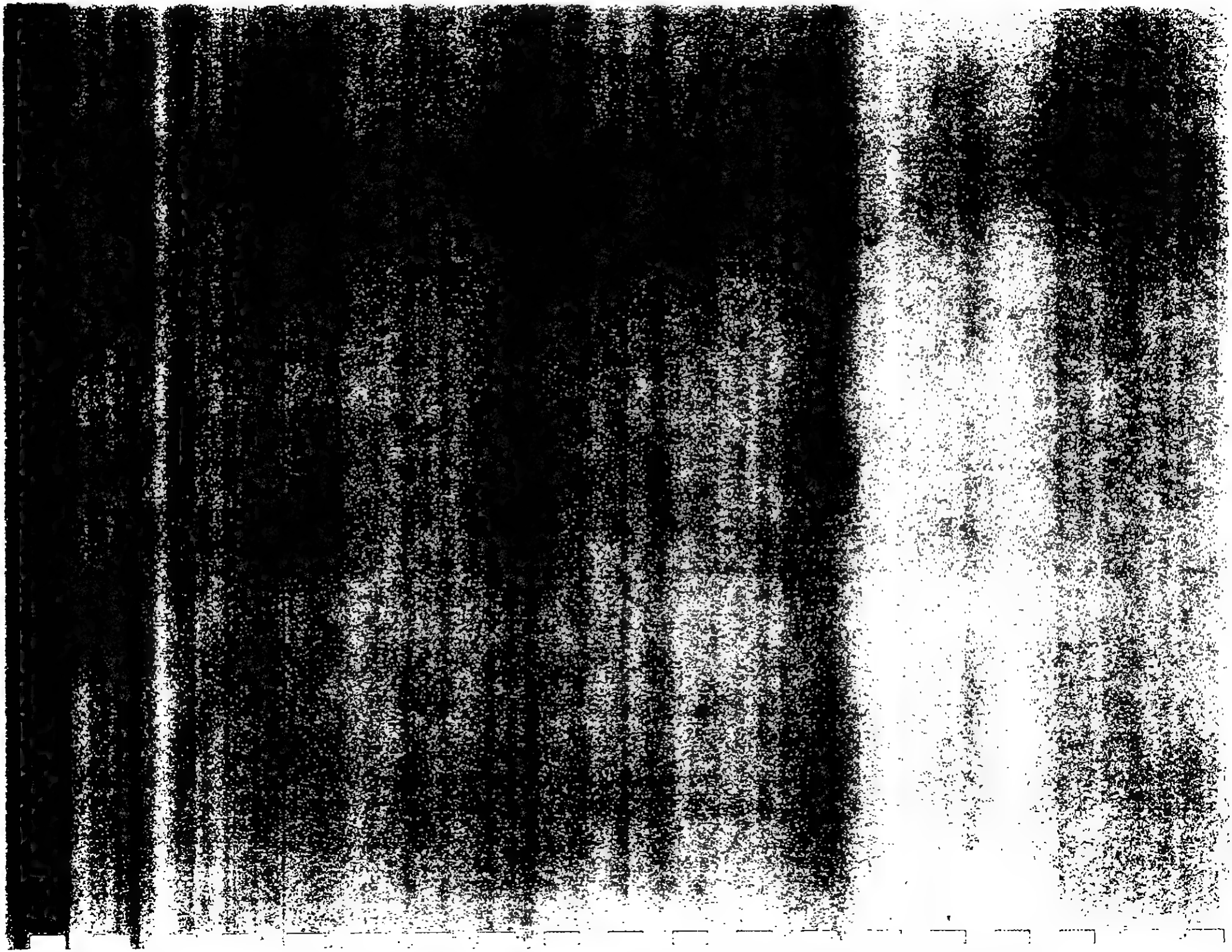
For requirements for the Local Control Panel, and for the emergency Power Supply to the Local Control Panel, refer to Attachment E1.

M. MANUAL PULL STATION/BREAK GLASS EMERGENCY SWITCH (TENANT SPACES)

Install a manual pull station with break glass rod. For requirements refer to Attachment E1.

N. KITCHEN EXHAUST

Tenants requiring kitchen exhaust systems shall provide New York City approved hoods, ductwork, grease/vapor removal devices and fire extinguishing equipment.



THE PORT AUTHORITY OF NY & NJ

MEMORANDUM

TO: L. Borrone, E. Butcher, R. Catlin, M. DePallo, R. Kelly
FROM: F. Lombardi
DATE: October 1, 1996
SUBJECT: **ESCALATOR SAFETY POLICY**

COPY TO: K. Antion

In order to maintain the high level of escalator safety and to establish consistency throughout our facilities, the following policy regarding the design and construction of PA and tenant escalators will be effective immediately.

- To meet the safety intent of the NYC Building Code, all new escalators in NJ, although not required by the NJ Uniform Construction Code, shall have a comb plate impact device with a vertical element setting of 45 lbs. for escalator width up to 32 in. and 60 lbs. for escalators wider than 32 in. and a horizontal setting of 112 lbs. at either side or 225 lbs. at center plate. Existing escalators installed with comb plate stop switches or step impact devices shall have the respective vertical element setting checked. If the present setting is higher than the required 45/60 lbs., it shall be reset to meet this requirement. If resetting is not feasible, a new comb plate stop switch with a vertical element setting of 45/60 lbs. shall be installed. Existing escalators which do not have a comb plate stop switch or step impact device shall be retrofitted with a comb plate step impact device with settings similar to the requirements for new escalators.

- Although not required by code, all existing escalators in NY and NJ with outboard trailing wheels shall be retrofitted with two undercarriage rail type supports running the full length of the escalator, thereby providing an extra measure of safety to prevent the remote possibility of a step collapsing. The new escalators shall either have the trailing wheels within the width of the step or have the two undercarriage rail type supports installed running the full length of the escalator.

All existing escalators shall be retrofitted to conform with this policy within two years of the date of this memo. Any exceptions to this policy will require the approval of the Chief Engineer. The work required to retrofit existing escalators should be done through the existing facilities maintenance agreements. All new escalators will be specified to adhere to this policy.

Francis J. Lombardi, P.E.
Chief Engineer

C. World Trade Center: See the published W.T.C. guidelines for HVAC and Fire Safety systems.

D. General:

1. PVC piping shall not be used above ground within buildings.

2. All new escalators in New Jersey shall have a comb plate impact device with a vertical element setting of 45 pounds for escalator width up to 32 inches and 60 pounds for escalators wider than 32 inches and a horizontal setting of 112 pounds at either side or 225 pounds at center plate. Also, all new escalators in New York and New Jersey shall have the trailing wheels within the width of the steps or shall have two undercarriage rail type supports for the full length of the escalator.

V. DETAILS OF MECHANICAL REVIEW

The following are representative of items reviewed:

A. The review shall extend to existing code violations in areas affected by the work.

B. In reviewing a proposed project, particular attention shall be given to:

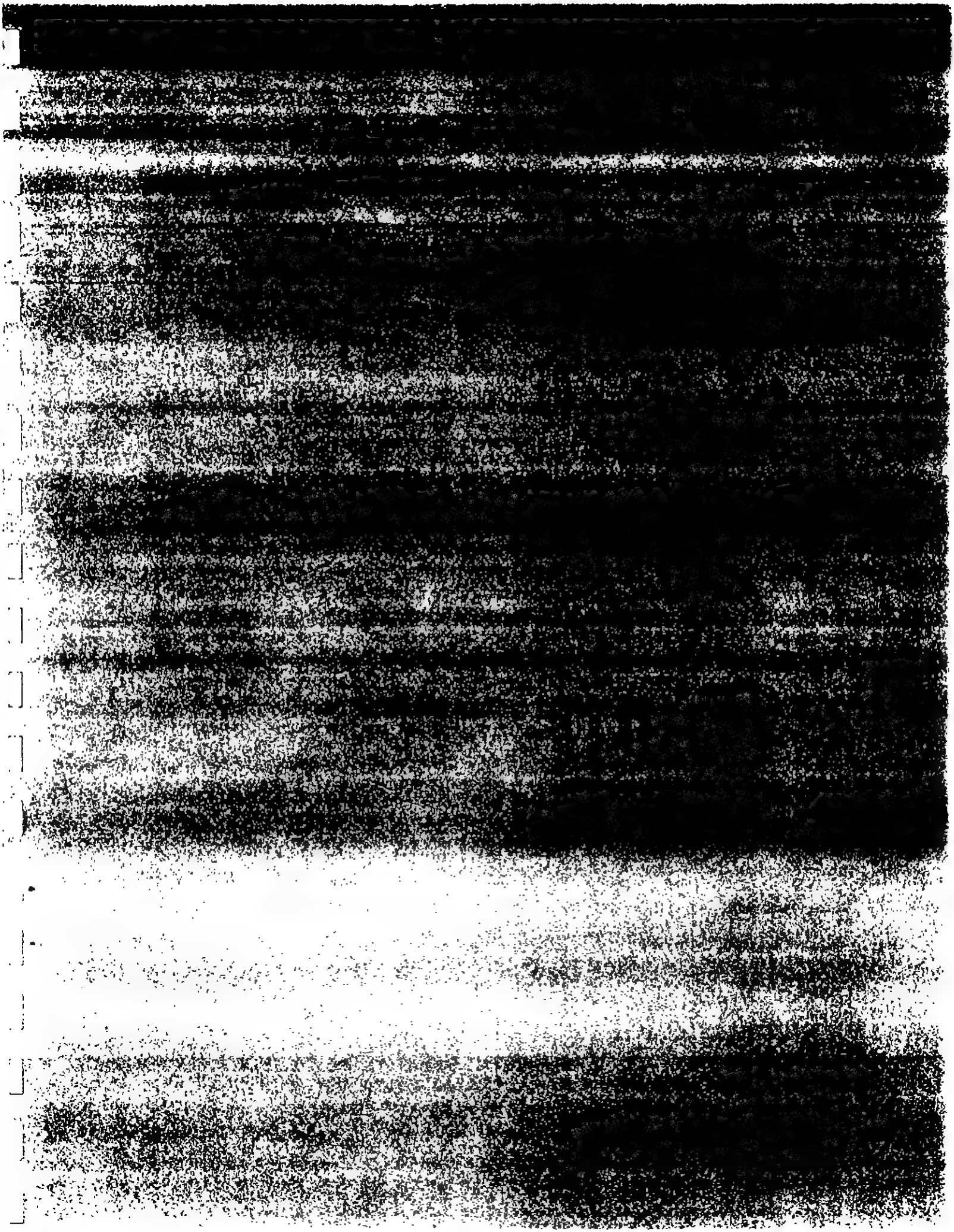
1. General system design.

2. Coordination of all new work with existing conditions.

3. Review of materials, operating and safety controls, equipment approval.

4. Requirements for system and equipment testing and inspection.

C. Work affecting the Aviation Fuel Servicing systems and Central Heating and Refrigerating Systems, including additional load



THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY

MEMORANDUM

TO: L. Borrone, M. DePallo, R. Kelly, K. Philmus, A. Reiss
FROM: Francis J. Lombardi
DATE: May 24, 1999
SUBJECT: **IMPLEMENTATION POLICY FOR THE MARKING OF TRANSPARENT GLASS DOORS AND SIDELIGHTS – (COPY IN DRAFT FORM IS ATTACHED)**

COPY TO: S. Bhol, R. Davidson, G. Dillon, J. Dinkels, J. DiSorbo, R. Finnegan, R. Franklin, P. Jacobsen, J. Lin, E. Lipson, A. Niro, S. Plate, P. Rinaldi, O. Suros, M. Valletta

In 1968 the NYC Board of Standards and Appeals adopted rules for the marking of transparent glass doors and sidelights. The markings are a visual cue to pedestrians, and are described in Chapter 4, Title 2 of the New York City Rules and Regulations.

I intend to issue the attached implementation policy to insure compliance with the marking rules at all Port Authority facilities including tenant areas. The policy is in draft form and any comments or questions you may have will be addressed before it is issued. If I receive no feedback by June 16, the policy in its present form will become final.

Francis J. Lombardi, P.E.
Chief Engineer

Attachment

PORT AUTHORITY OF NY & NJ
QUALITY ASSURANCE DIV.
ENGINEERING DEPT.
MAY 27 1999
RECEIVED
TO

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY

MEMORANDUM

To: Francis J. Lombardi, P.E.,Chief Engineer
From: Robert I. Davidson
Date: April 29, 1999
Subject: Rules for the Marking of Transparent Glass Doors and Sidelights
Ref: Implementation Policy (draft attached)

Copy: S. Bhol, G. Dillon, J. Dinkels, J. Disorbo, R. Franklin, P. Jacobson, C.J. Lin, E. Lipson, P. Rinaldi, O. Suros

In 1968 the NYC Board of Standards and Appeals adopted rules for the marking of transparent glass doors and sidelights. The markings are a visual cue to pedestrians and are described in Chapter 4, Title 2 of the New York City Rules and Regulations. An implementation policy on the marking requirement is needed for the following reasons.

The glass marking rules are not in the NYC Building Code, the primary life-safety reference for architects and engineers. This increases the risk that the marking requirement could be overlooked or misunderstood.

The rules have been mandatory in New York City since 1968. For New Jersey and Yonkers, however, no comparable requirements could be found. Therefore, for consistency, your approval is requested to make the rules applicable to all new construction and alterations in both states. This also applies to Port Authority tenant facilities.

Further, since glass markings are a safety issue, the rules will be applied retroactively for our facilities in both states, including tenant areas that have glass doors and sidelights, which open onto Port Authority circulation spaces. Since the survey will not include the interiors of tenant areas or buildings, tenants will be advised to check the interiors of their facilities for compliance with the rules.

Robert I. Davidson, FAIA
Chief Architect

Approved: 4/30

Francis J. Lombardi, P.E.
Chief Engineer

IMPLEMENTATION POLICY FOR THE MARKING OF TRANSPARENT GLASS DOORS AND SIDELIGHTS (DRAFT 4-26-99)

In 1968 the NYC Board of Standards and Appeals adopted rules for the marking of transparent glass doors and sidelights. The markings are a visual cue to pedestrians, and are described in Chapter 4, Title 2 of the New York City Rules and Regulations. They apply to all buildings except one and two family residences.

A copy of the rules with a graphic illustration is attached. A variety of design options are permitted for achieving compliance including horizontal bars, painted or engraved patterns and raised window bases.

The rules have been mandatory in New York City since 1968. For New Jersey and Yonkers, however, no comparable requirements could be found. Therefore, for consistency, the rules are applicable to all new construction and alterations in both states. This also applies to Port Authority tenant facilities.

Further, the rules will be applied retroactively to facilities in both states This includes tenant areas that have glass doors and sidelights opening onto Port Authority circulation spaces such as concourses, lobbies, sidewalks, corridors and plazas. Since the survey will not include the interiors of tenant areas or buildings, tenants will be advised to check the interiors of their facilities for compliance with the rules.

§II4-02 Marking of Transparent Glass Doors and Fixed Adjacent Glass Sidelights.

§II4-02(a) *Scope.* These rules shall be applicable to all structures or any part thereof excepting one and two family structures.

§II4-02(b) *Definitions.*

Sidelights. Fixed panels of transparent glass which form part of or are immediately adjacent to and within six feet horizontally of the vertical edge of an opening in which transparent glass doors are located. For purposes of this section, a sidelight shall consist of transparent glass in which the transparent area above a reference line 18 inches above the adjacent ground, floor or equivalent surface is 80 percent or more of the remaining area of the panel above such reference line.

Transparent glass. Material predominantly ceramic in character which is not opaque and through which objects lying beyond are clearly visible. For the purpose of this section, rigid transparent plastic material shall be construed as transparent glass.

Transparent glass door. A door, manually or power actuated, fabricated of transparent glass, in which the transparent area above a reference line 18 inches above the bottom edge of the door is 80 percent or more of the remaining area of the door above such reference line.

Transparent safety glazing materials. Materials which will clearly transmit light and also minimize the possibility of cutting or piercing injuries resulting from breakage of the material. Materials covered by this definition include laminated glass, tempered glass (also known as heat-treated glass, heat-toughened glass, case-hardened glass or chemically tempered glass), wired glass, and rigid plastic.

§II4-02(c) *Requirements.*

§II4-02(c)(1) Transparent glass doors and fixed adjacent transparent glass sidelights shall be marked in two areas on the glass surface thereof.

§II4-02(c)(2) Fixed adjacent transparent glass sidelights 20 inches or less in width with opaque stiles at least one and three-quarters inches in width shall be exempt from the marking requirements.

§II4-02(c)(3) Where the ground, floor or equivalent surface area in the path of approach to a fixed adjacent transparent glass sidelight from either side for a minimum distance of three feet from such sidelight is so arranged, constructed or designed as to deter persons from approaching such sidelight or a permanent barrier is installed in the path of approach, the sidelight shall be exempt from this requirement.

§II4-02(c)(4) Decorative pools, horticultural planting or similar installations shall be considered as indicating that the ground, floor or equivalent surface area is not a path of approach. Planters, benches and similar barriers which are securely fastened to the floor or wall to prevent their removal shall be considered as blocking the path of approach provided they shall be not less than 18 inches in height from the ground, floor or equivalent surface and extend across at least 2/3 of the total width of the glazed area of the sidelight.

§II4-02(c)(5) Fixed adjacent transparent glass sidelights which are supported by opaque sill and wall construction of at least 18 inches above the ground, floor or equivalent surface immediately adjacent shall be exempt from the marking requirements.

§II4-02(c)(6) Display windows in any establishment, building or structure which fall within the definition of a sidelight shall be exempt from the marking requirements if the top of the supporting sill and wall construction is not less than 18 inches above the ground, floor or equivalent surface immediately adjacent and the interior area

is occupied with merchandise or similar displays to clearly indicate to the public that it is not a means of ingress or egress.

§II4-02(d) *Marking locations.*

§II4-02(d)(1) One such area shall be located at least 30 inches but not more than 36 inches and the other at least 60 inches but not more than 66 inches above the ground, floor or equivalent surface below the door or sidelight. The use of horizontal separation bars, muntin bars or equivalent at least one and one-half inches in vertical dimension that extend across the total width of the glazed area and are located at least 40 inches but not more than 50 inches above the bottom of the door or sidelight is permitted in lieu of markings.

§II4-02(d)(2) The marking design shall be at least four inches in diameter if circular or four inches in its least dimension if elliptical or polygonal, or shall be at least 12 inches in horizontal dimension if the marking is less than four inches in its least dimension. In no event shall the vertical dimension of any marking including lettering be less than one and one-half inches in height.

In addition to horizontal muntin bars, separation bars or equivalent, any of the following methods may be used to alert persons to the presence of transparent glass doors and fixed adjacent transparent glass sidelights in their path of movement:

(i) Chemical etching

(ii) Sand blasting

(iii) Adhesive strips not less than one and one-half inches in vertical dimension extending across at least two-thirds of the total glazed area

(iv) Decals

(v) Paint, gilding or other opaque marking materials

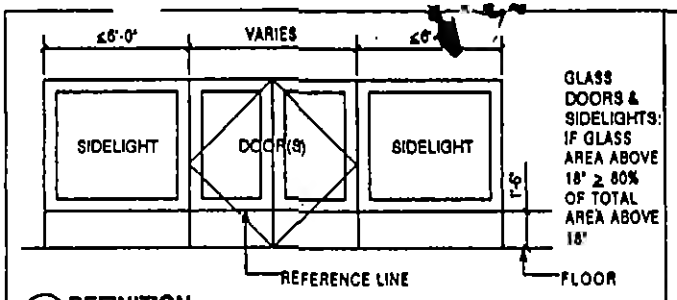
(vi) Opaque door pulls or push bars extending across at least two-thirds of the total width of the glazed area.

§II4-02(e) *Replacement and new installations.*

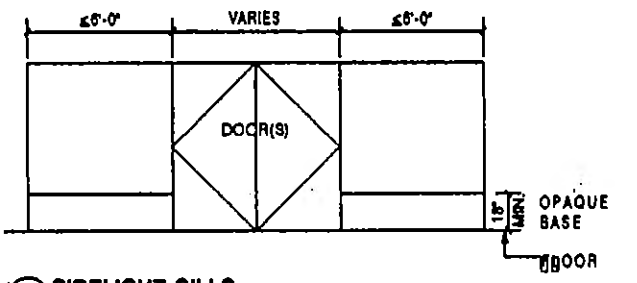
§II4-02(e)(1) Any transparent glazing material used for replacement in existing transparent glass doors after January 1, 1969 shall be transparent safety glazing material. Transparent safety glazing material shall be used in all new transparent glass doors installed after January 1, 1969. The manufacturer's permanent identification mark denoting safety glazing materials shall be visible on the glass after installation of the door.

§II4-02(e)(2) Replacement of fixed adjacent transparent glass sidelights after January 1, 1969 shall be of transparent safety glazing material or annealed glass at least one-half inch in thickness. New fixed adjacent transparent glass sidelights installed after January 1, 1969 shall be of transparent safety glazing material or annealed glass at least one-half inch in thickness. The manufacturer's permanent identification mark denoting safety glazing material shall be visible on the glass after installation of the sidelight.

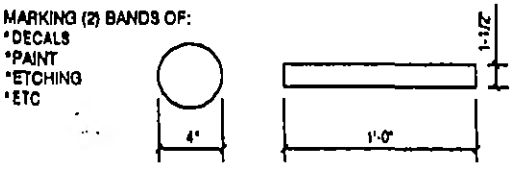
Note: If safety glazing material is not immediately available as replacement glass in transparent glass doors and fixed adjacent transparent glass sidelights, temporary relief from the requirements rule may be sought by petitioning the Board of Standards and Appeals of the City of New York for a modification.



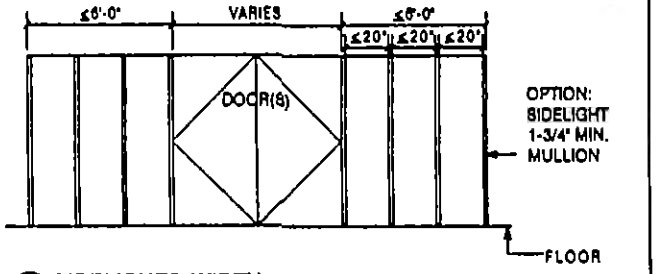
(A) DEFINITION
SECTION NO. 02(b)



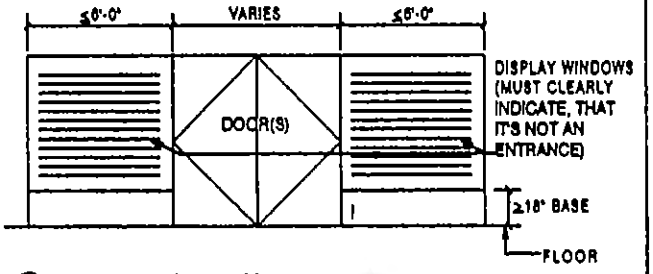
(E) SIDELIGHT SILLS
SECTION NO. 02(c)(6)



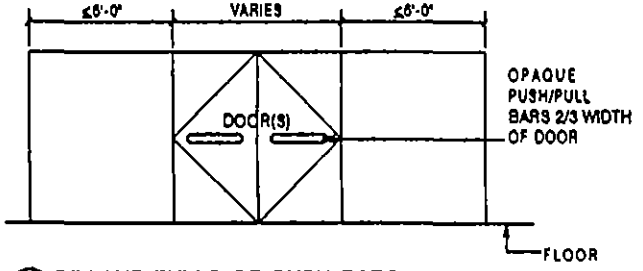
(I) MARKING DESIGN
SECTION NO. 02(d)(2)(i,ii,iv,v)



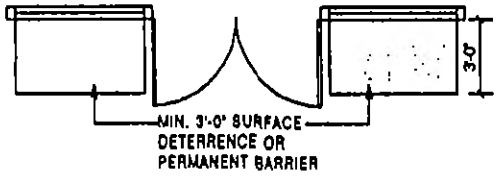
(B) SIDELIGHTS WIDTH
SECTION NO. 02(c)(2)



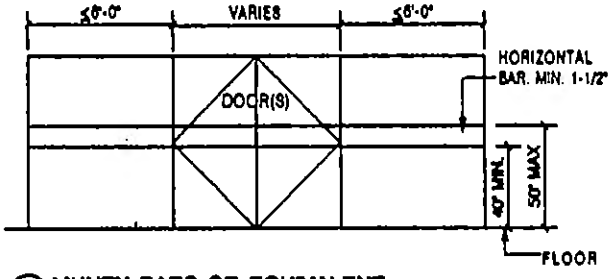
(F) DISPLAY WINDOWS
SECTION NO. 02(c)(6)



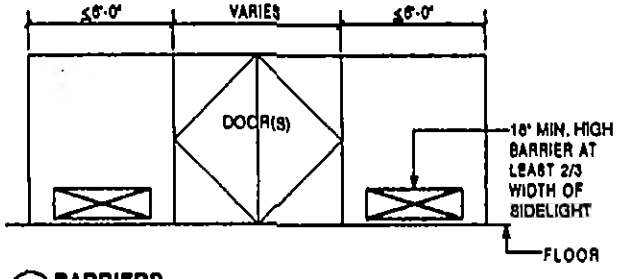
(J) OPAQUE PULLS OR PUSH BARS
SECTION NO. 02(d)(2)(v)



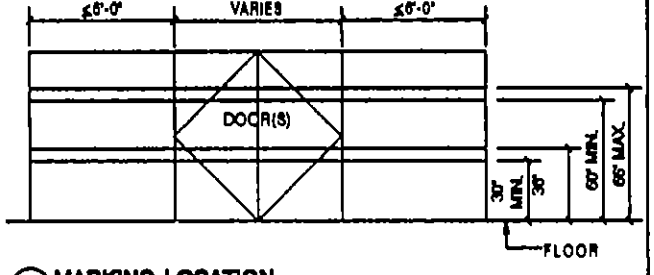
(C) SURFACE DETERRENCE
SECTION NO. 02(c)(3)



(G) MUNTN BARS OR EQUIVALENT
SECTION NO. 02(d)(1)



(D) BARRIERS
SECTION NO. 02(c)(4)



(H) MARKING LOCATION
SECTION NO. 02(d)(1)

THE PORT AUTHORITY OF NY & NJ
SURVEY FOR THE MARKINGS OF GLASS
DOORS & FIXED GLASS SIDELIGHTS

GRAPHIC REFERENCE GUIDE

TING & LI ARCHITECTS
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New York, NY 10012

DATE: Oct. 26, 1998
NOT TO SCALE